

A-4-b. Soil Features Definitions

The Soils Features report provides estimates of important soil features used in land use planning that involves engineering considerations. Soil features that are covered in the report include restrictive layer (eg. bedrock depth and hardness, cemented pan depth and hardness), subsidence, potential frost action, and risk of corrosion for uncoated steel and for concrete.

The official copy of the Soil Features report is located in an **Access** database and can be electronically created. The Access database is accessible by every NRCS Hawaii employee who uses Toolkit. The Access database reports are also available via the following electronic Field Office Technical Guide (eFOTG) websites:

<http://www.nrcs.usda.gov/technical/efotg/> or <http://my.nrcs.usda.gov>

Following are definitions of the soil features listed in the report:

Restrictive layer is the kind of material such as bedrock, cemented pan, or abrupt textural change, that is nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly reduce the movement of water and air through the soil, or that otherwise provide an unfavorable root environment. The kind of restrictive layer is specified if it occurs within a depth of 60 inches. The depth is based on many soil borings and observations made during soil mapping.

Bedrock is specified as either "paralithic" or "lithic". If the bedrock is paralithic, excavations can be made with trenching machines, backhoes, or small rippers. If the bedrock is lithic, blasting or special equipment generally is needed for excavation.

Cemented pan is a nearly continuous layer of indurated or strongly cemented material having a hard, brittle consistency because the particles are held together by cementing substances such as, calcium carbonate, or oxides of silicon, iron, or aluminum. Pans are classified as "thin" or "thick". "Thin" cemented pans are thin enough so that excavations can be made with trenching machines, backhoes, or small rippers and other equipment common to construction of pipelines, sewerlines, cemeteries, and the like. "Thick" cemented pans are sufficiently thick or massive to require blasting or special equipment beyond which is considered normal in excavating for this type of construction.

Subsidence is the decrease in surface elevation as a result of drainage of wet soils that have organic layers or semifluid mineral layers. *Initial subsidence* is the decrease of surface elevation that occurs within the first 3 years of the drainage of these wet soils. *Total subsidence* is the potential decrease of surface elevation as a result of the drainage of these wet soils. The susceptibility of soils to subside is an important consideration for organic soils that are drained.

Potential frost action is the likelihood of upward or lateral movement of soil by the formation of segregated ice lenses (frost heave) and the subsequent loss of soil strength upon thawing. The following classes are used in regions where frost action is a potential problem: (1) Low -- soils are rarely susceptible to the formation of ice lenses, (2) Moderate -- soils are susceptible to the formation of ice lenses, resulting in frost heave and subsequent loss of soil strength, and (3) High -- soils are highly susceptible to the formation of ice lenses, resulting in frost heave and subsequent loss of soil strength.

Risk of corrosion is the potential for metals and other materials to corrode when on or in the soil. Some metals and materials corrode more rapidly when in contact with specific soils than when in contact with others. Corrosivity ratings are given for two of the common structural materials, uncoated steel and concrete. The risk of corrosion classes are low, moderate, and high.

See Exhibit 618-1 or Exhibit 618-2 in Part 618 of the National Soils Survey Handbook for guides for estimating risk of corrosion for uncoated steel or concrete.